

# KANTO

Instant Outdoor Sauna

Florian Ganter  
Master Thesis 2011

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Aalto University  
School of Art and Design  
Department of Spatial Design  
2011

## Abstract

**Instant Outdoor Sauna**  
**Spatial Design Department**  
**Master Thesis**  
Florian Ganter

Sauna has a very old and mythical history in numerous countries. Especially the Finnish sauna has a long heritage evolving over time and not losing its importance even today. Unfortunately, nowadays sauna design seems to concentrate more on modern technical aspects like integration of RGB lights and television flat-screens rather than developing the idea of sauna in a meaningful way any longer.

This project, as part of my masters' thesis in spatial design, takes a close look into the Finnish sauna culture, into traditional artisan and building techniques and uses the gained knowledge to evolve the traditional yet contemporary sauna bath. The outcome is an independent sculptural outdoor sauna, which blends into the landscape from the outside and is filled with atmosphere in the inside. Traditional and yet new due to the internal arrangement and the use of materials; it is a statement worth discussing. Eventually, I hope it will stimulate people to create similar objects thus introducing more meaning to everyday sauna life - again.



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I am very interested in the sauna culture and therefore I started a small study about this theme for a contest. In this research I found out that sauna has a very old and very mythical history, which covers many countries. My attempt was to study sauna culture and the spatial arrangements of sauna and develop my own sauna based on it.

Finnish sauna has a long heritage, unfortunately nowadays the sauna design seems to concentrate on modern technical aspects like RGB lights and flat-screens and not to develop the idea of the sauna in a meaningful way any longer. This project, as part of my masters' thesis in spatial design, takes a close look into Finnish sauna culture, into traditional artisan techniques and uses the gained knowledge to evolve the traditional yet contemporary sauna bath. The outcome is an independent sculptural sauna, which blends into the landscape from the outside and is filled with atmosphere in the inside. Traditional and yet new due to the internal arrangement and the use of materials; it is a statement worth discussing. Eventually, I hope it will stimulate people to create similar objects thus introducing more meaning to everyday sauna life - again.

Some thoughts upfront: my original plan of the thesis was to make a sauna compendium, a book where you can find everything useful or not so useful about building, maintaining and using a sauna. After digging deeper into the topic I learned that there are actually plenty of books about sauna. The list can be found in my reading list at the end of the thesis. So, as it turns out this will not be a sauna compendium but more a personal approach to the theme with the focus on the basics and some sauna aspects, which I found the most interesting.

**The physical sauna**

History of the sauna building

The prehistoric sauna

The initial stages of sauna are to be found at Stone Age dwelling sites among the remains of excavated hearths and fireplaces. The fireplaces were so called pit hearths, round-bottomed pits up to a metre and larger in diameter and thirty centimetres deep, with two or three stones on the bottom. After heating the stones a tent, for example made of poles and hides, would have been erected over them.

The original sauna

During the time of hunters and fishermen, saunas were temporary structures that were easy to build up. A conical hut like a tepee would have been suitable for this purpose. However, the high conical form was a poor design for a sauna, as the heat would rise to the top part. A lower hut of rods and branches connected with osier stakes would have been better, especially if it was partly sunk in the ground. Later, as mobility lost its importance the sauna was built deeper into the ground, and was thus protected from wind and frost and the floor was warmer and free from draught. It finally became a “underground cabin”, which had the function of both a dwelling and sauna. Stones were carried into the hut and they were heated red-hot, then water was thrown on the stones to produce the steam to heat the hut. The hut transformed in being used just a sauna with time.

The walls the sauna would be of bare earth, sometimes lined with thin round logs or later on with halves of round logs. After mastering the log joining technique, people built two or three courses of logs on top of the sauna to protect it from weather. The sauna had a low two-faced, saddle-back roof with a layer of birch-bark and turf on top. In the summertime long grass would grow on the roof and hide the sauna in a green grassy hill. In the wintertime it would be completely covered in snow.



1. sketch of a prehistoric sauna, Erkki Helamaa

The origins of the Finnish sauna can be already found back then: next to the door there stood a stone-laid stove and on the rear or side wall was a bench made of split log, which was later replaced by a platform on posts. (Erkki Helamaa, Finnish Sauna 1994)

These underground saunas remained in use for a long time: according to the observations of ethnographer Samuli Paulaharju made in 1907/1908 it remained the sauna of the poor as it was dug in the ground and thus little timber was needed. Underground saunas were used again during the Second World War in front line conditions. The saunas needed to withstand enemy fire, and were thus built underground and sturdy logs were used for walls and ceiling. The building style is called “Korsuarkkitehtuuri”, which literally translates to “dugout architecture”.

The basic sauna

A major change in construction of Sauna building occurred through the discovery of new joining and hewing techniques. This lead to corner-joining of logs instead of using upright hut constructions. Even though there are regional differences, there are also many similarities. Today this type of sauna is referred to as a smoke sauna. The building was a simple rectangular log structured building. The logs were stripped of bark, had a round shape and they were laid and joined in horizontal courses. In the intersection of the logs the joining technique was used: carving a notch in a log corresponding to the round form of the log, which was laid upon it. Later on the log was carved on both sides, which was developed into numerous even decorative interweaving techniques over time. Insulating the sauna walls was not a great concern, either it was forgotten or deliberately left out in the lower courses to establish better ventilation in the sauna.



2. underground sauna from Valkjärvi, now in Muurame sauna museum



3. log construction - various joints



The insulation materials used between the upper logs were clay and moss. Inside the building there was a stove covered with stones, which brought the building up to a high temperature. The special character of the sauna lies in the quality of the hot, dry air, which changes when water is being poured on the stove. Achieving the right balance of heat, humidity and ventilation is the art of building a sauna. (Sauna - made in Finland)

In Western Finland the Sauna building was placed in the centre of the enclosed farmyard, in Eastern Finland outside the yard, to take into account the fire safety, next to a well or spring. These buildings had a shelter in front of the entrance for people to change. The shelter was built by driving stakes into the ground, with spruce branches hung from it during the winter. Commonly, also a gable roof above the entrance would be built and one side would be closed with timber boards, stones or logs. The first saunas were built on bare ground, later on they were covered with stone slabs, loose boards or poles which evolved eventually into floorboards and concrete floors. The roofing was made of birch-bark, peat, straw, boards or beams. Shingled roofs were introduced in the 19th century. Also other building techniques were developed for sauna building: with the introduction of hewing straight carved logs were used. The former carved corner joint was followed by straight ones, which later lead to more ornamental and dovetail corners in the 1920's and 30's. After that time mostly vertical boards were used in urban sauna buildings and the log construction was abandoned. In the original saunas the ceiling and the roof were connected, so that the shape of the ceiling would depend on the design and shape of the roof. Later on the inside ceiling became an independent element. The style of doors, the fittings like hinges and handles and the overall simplicity of construction are characteristic for the sauna architecture. There was no hot water available in sauna in earlier times, only cold water for washing was being used, so one could go for a dip in the lake or sea or roll in the snow.

Circular sauna

In the beginning of my research, I assumed that circular saunas are quite rare as one is mainly getting in contact with the “L” shaped, or with the “U” shaped seating arrangement. During closer examination I found out that there is in fact a number of saunas with circular seating arrangement and the stove in the centre. Nevertheless most of these saunas are just restricted to the circular seating arrangement. They keep the surrounding box shape and do not continue the circular shape into the spatial environment with walls and roofing which are supporting the flow of the löyly as well. Already General Paavo Talvela (1897-1973) had the theory that a fully balanced heat could only be achieved in a round space. This circular “commanders sauna” was built in Nurmoila, drawn by architect Aulis Kalman and gained public attention in Finland.



4. General Paavo Talvela's round sauna being constructed at Nurmoila



5. KissSalis Therme, Bad Kissingen



6. circular banya, Russia



7. Hotel BM International, Sarajevo



8. Kelo-Erdsauna, Schwäbisch Hall



9. tent sauna, Niinisaari, 1990



10. council of state sauna Helsinki

Sauna heating methods

There are different ways to heat a sauna. Amongst them are wood-fired, electric stoves and stoves heated with other fuels like natural gas or oil. In the following I will concentrate on the wood-fired stoves.

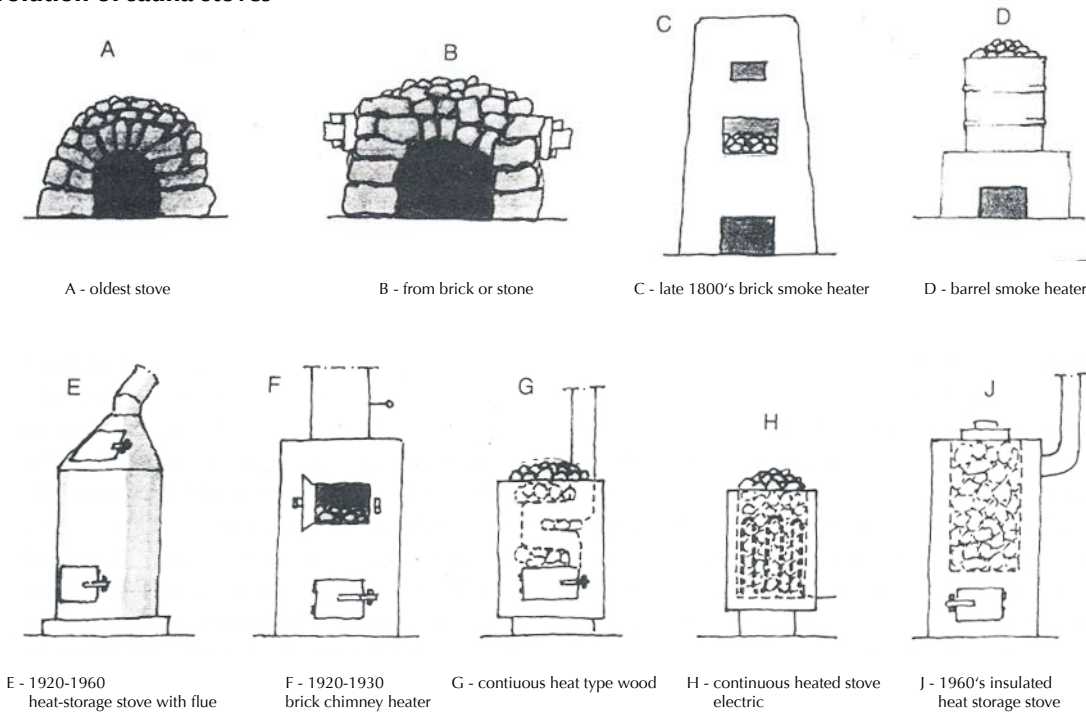
They are divided into:

**Stoves without flues:** the so called “smoke sauna stove” is made of basic stones or bricks and not connected to a flue. As the flames are passing through the stones and the stove is uncovered inside the sauna there is fire hazard. The air and the sauna is getting sooty and have to be cleaned before use. The soot is also a disinfectant, though. The heating time is 2 - 4 hours.

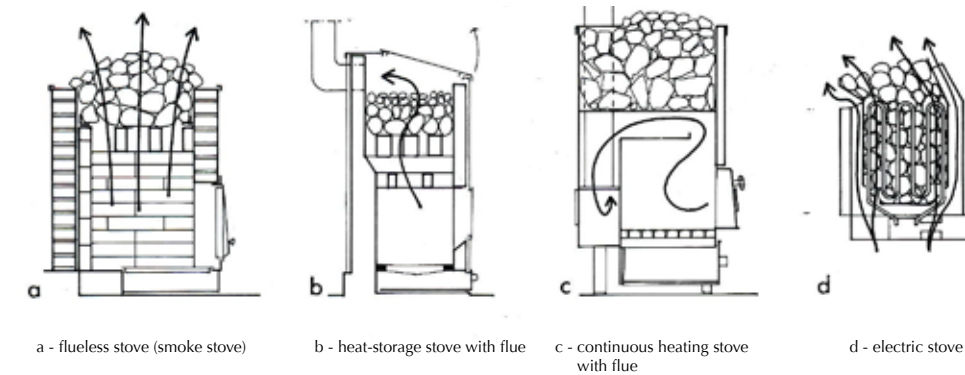
**Stoves with flues:** the **heat-storage stove** is heated before bathing in one single process and the heat is stored in the stones of the oven. The heat storage stove is a development out of the smoke stove and the stones are in contact with fire, which means the oven gets sooty, as does the air. The heating time takes 1-2h, which means it is slower to heat up.

The **continuous heated stove** can be heated during bathing, as the wood is burned in a separate chamber and the flames are not passing the stones. The oven can be used to warm the water by fixing a warm water boiler to the oven or the smoke pipe. The heating time is around half an hour. The continuous heating stove is drying the air inside the sauna, but it is a very fast oven.

Evolution of sauna stoves



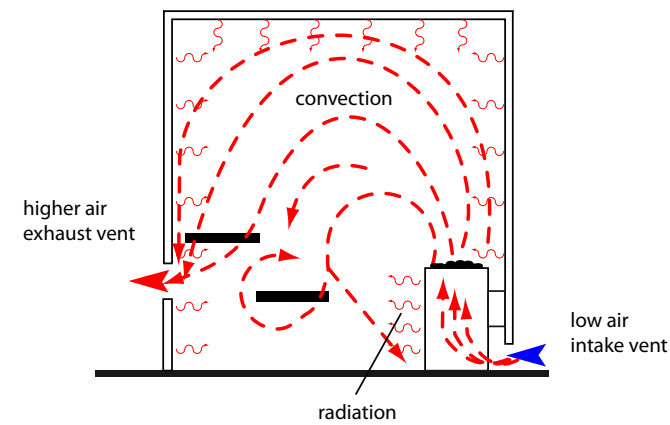
Stove types



## Heat inside the sauna

The heat transmission works over both convection and radiation from the stove and from the wall and ceiling. The ideal situation is that the heat radiation is symmetrical, that means that the heat is coming with the same amount from different sides. The radiation of convection and the radiation of heat should be ideally at the same level.

When there is a lack of space in the sauna, the heat radiation might be stronger than the convection and as well the air cushion between the oven and the bather is missing, which is dampening the impact of the steam.



13. air circulation and radiation inside sauna

**The spiritual / cultural / social sauna**

## Introduction to sweat baths

It is considered that through the ages people have taken sweat baths in different forms and for different purposes:

- religious ceremonies
- healing illnesses
- bodily cleaning / purification
- relaxation
- social life.

The procedure of sweat baths constitutes of exposing the body to a high temperature for a longer time making the body start to perspire. The skin cleanses itself from impurities through perspiration and the heat relaxes the muscles and so relieves muscular aches and pains.

## Brief bathing and sauna history

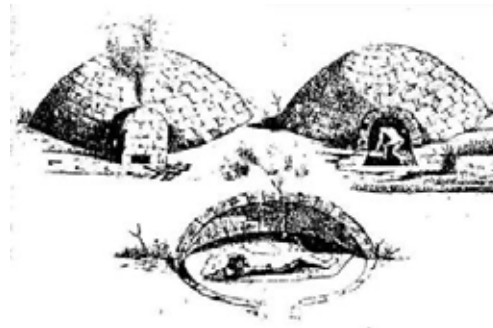
Sauna is not originated in solely in Finland, the Romans and Celts had similar baths just like sauna called “thermae” and “balnae”. The sweat bathing culture is also spread all over the world: in Turkey, most of the middle east and Maghreb people call their bath “hammam”, the American Indians have their sweat lodges called “Inipi”, in Japanese culture the hot water baths “o-furo” and “sentoo” can be found. In Russia it is called “banja” and in Mexico “temazcal”. In Europe public baths have been common since the Roman times, but during the 15th and 16th centuries bath houses were ordered to close due to prevalent promiscuity and the danger of epidemics. It was only in secluded areas like northern Russia, Estonia and Finland where the bathing habits continue to be untroubled even today.



14. a traditional private ofuro in a Ryokan in Kyoto



15. the interior of a typical Russian banya



16. Mexican vapor bath or Temazcal

## Indian Inipi

The Indian Inipi could be seen as the oldest type of sauna bath.

The Inipi ceremony is a type of sweat lodge and part of the north american indian Lakota purification ceremony. It is an ancient and sacred ceremony of the Lakota people and has been passed down through the generations of Lakota. The sweat lodge is constructed by a frame of saplings covered with hides or blankets. Stones are heated in a fire and placed into a central pit in the lodge. Water is then poured on the stones to create hot steam.



17. Dakota sweat lodge and bathers in 1898. The buffalo hides and blankets have been lifted up for the purpose of the photograph.

## Sauna tradition in Finland / Folk tradition

The sauna is an important part of the Finnish national identity. Although the Finns have not invented the sauna in the first place, they have guarded its age-old traditions and rituals, and going to sauna is becoming even more popular today. Sauna is probably the most widely spread Finnish loanword.

Sauna can be seen as national custom, as 90% of Finns still go to Sauna every week. There are 1,7 Mio. saunas in Finland, around one for every three inhabitants (Sauna - made in Finland). Sauna is part of life for people of all ages, both as means of ritual and washing so that a Sunday or holy day is still preceded by sauna the evening before. Going to sauna is regarded as almost sacred event, it is not appropriate behaviour to quarrel or swear in sauna. Visitors to summer cottages are offered a sauna bath, and a sauna included in summer excursions, meetings and visits.

The technique of bathing by throwing water on heated stones was not invented by Finns. Sauna can be seen as joint heritage of the Finnish people of the Baltic region, as the word “sauna” exists in all Baltic languages. The difference of bathing in other countries and sauna lies in the fact that the humidity of

the air in the hot dry sauna is altered by throwing water on the hot stones.

The sauna was the first building to be erected by settlers at a new site and it was often located beside a lake or a river, which were primary transport routes at that time.

There are cultural differences in sauna bathing between Western and Eastern Finland: in the Western Finland people usually go to Sauna once a week and use the Sauna building for household purposes in the meantime: dry plant fibres for spinning, cure meat, malt and dry grain, washing clothes. Whereas in the Eastern Finland sauna is only used for bathing and heated more frequently; it can be heated up to 10 times a week, particularly when clearing land for slash- and-burn cultivation.

Traditionally the whole family would go to sauna together, as the fire had to be put out before entering and the sauna stove held its heat only for a certain length of time in the early evening; this included all generations and also hired workers. In the early industrial communities, everybody went to sauna together regardless of gender, even strangers. This persisted in public saunas as urbanisation proceeded and was a natural state of affairs up to the early years of the 20th century. Later it became normal for men and women to go to public sauna at different times or to use separate saunas.



## A recommended sauna procedure

Some call it sweat pleasure, some sauna fun. In any case sauna bathing is one the last of official rites, which has been existing since ancient times. To give a glimpse into the sauna experience and its procedure some basic guidelines are mentioned here.

- Take enough time for your sauna bath, an hour and a half minimum.
- the clothes are left in the dressing room, one should remember to bring a clean set of clothes to wear after the sauna.
- take something to sit on during the sauna bath - small towel, paper, wooden board
- clean yourself under the shower before entering the steam room, this is also moistening the skin and removes body odours or perfumes
- take the first bath in the hot steam room. The recommended temperature is 80 to 90°C, at most 100°C. As the air might be dry at first, one should increase the humidity by throwing water onto the hot stones of the stove. The use of the birch whisk is not recommended during the first round, because the skin has not yet softened adequately.
- when you feel hot enough leave the steam room and refresh yourself by taking a shower or a swim or just by sitting in room temperature or outside.
- drink something if you feel thirsty, but avoid alcohol in the sauna



18. wooden boards to sit on during the sauna bath  
mainly used in smoke sauna to stay free from soot

- the second round in the hot steam room should be more humid than the first round. After warming up one is able to use the whisk, which feels best with the right humidity and temperature.
- cool off again
- the hot / cold cycle can be repeated as many times as one feels comfortable with. For many people two rounds is usually the right amount. The whisk is to be used according to ones preference. Shortly return to the hot steam room to warm up and to soften the skin.
- wash yourself under the shower or go for a swim
- dry yourself with a towel or just by sitting in room temperature. One can also lay down and take a rest for a while if one feels like it
- a refreshing drink and a salty snack according ones personal taste is recommended
- allow enough time for cooling off before putting the clean clothes on, as the sweating might still continue
- mind cold currents, as the body is in more “sensitive” state after sauna
- leave the sauna and the dressing room in tidy condition.



19. sauna whisk made of birch branches



## Sauna in culture

Sauna is the theme of many parables, poems, phrases and stories. In the national epic Kalevala, the smith Ilmarinen asked his sister Anni to heat the sauna when he left to look for his wife. In Aleksis Kivi's Seven Brothers they were bathing in their sauna so vigorously it burned down. In ancient midsummer nights, which are traditionally time for finding a mate, a wise man or woman used to bath unmarried girls with a whisk made of leafs from nine different trees and washed them with water taken from three different springs that had been spiked by putting the engagement ring in the water bucket.

### Saunauluja

Sauna songs and chants belong to Finnish culture. After sauna bathing it is nice to sing songs which keep up the community spirit.

The following sauna song is based on the tunes of Kalevala:

Terve löyly, terve lämmin  
terve henkäys kiukainen,  
kylpy lämpimäin kivisten,  
hiki vanhan Väinämöisen.  
Löylystä vihannan vihdan,  
tervan voimasta terveiden.

Löyly kiukahen kivistä,  
löyly saunan sammalista.  
Tervehyttä tekemähän,  
rauhoa rakentamahan,  
kipehille voitehiksi,  
pahoille parantehiksi.



20. print commercial, Karhu Sinebrychhoff



21. still from the documentary „Miesten Vuoro“, 2010

## Sauna in pop-music

Martti Servo ja Napander - Sauna

Mitä kertoisin hälle  
jota kiire pakottaa?  
Jolla jota paikkaa kolottaa  
ja paine ahdistaa

Minä ohjaisinko etelään kuin  
lintu lentämään? Vai turvautumaan  
pilleriin niin käänteentekevään?  
En tietenkään, sillä lääke löytyy  
lähempää, se on joka järven rannalle  
kuhmossa ja vantaalla

Sauna! Sielä krampit laukeaa, se on sauna  
Sielun solmut aukeaa, kun kiukaanposket  
punaisina hohkaa kuumuttaan voin taata  
että turhat kiireet ryntää unholaan  
Sauna! Se on Sauna

Jos ystävien välillä on vihanpitoa, katkeria  
sanoja ja mykkäkoulua, on paras heidät  
samaan saunaan saada mahtumaan ja sadan  
asteen jälkeen kaikki anteeks antamaan  
sillä tietenkin, aina löyly vihan lauhduttaa  
ei riita elä lämmössä koivuvastan läiskeessä

Sauna! Sielä krampit laukeaa! Sauna! Sielun solmut  
aukeaa, kun kiukaanposket punaisina hohkaa  
kuumuttaan, voin taata että turhat kiireet ryntää  
unholaan

Sauna! (Sauna!) Sauna! (Sauna!) Se on sauna  
(Sauna!) Sauna! (Sauna!) Se on sauna

### Sauna food

Sauna is very connected to food, as it has been used since the early times to preserve fish and meat by the means of drying or smoking. Also malt was dried inside sauna.

There is several ways to prepare food in sauna. One can put for example a sausage (“saunamakkara”) directly onto the stove and let it grill there, or put it on the stick into the fire of the stove (if it is wood-fired) or one can get a makkara pussi (sausage bag) from the store, put the sausage in there, leave it plain or spice it up with some vegetables, cheese and a splash of beer and put it for twenty minutes in the hot embers in the stove. Hyvää ruokahalua!



22. kiuasmakkara on a sauna stove

### Old sauna proverbs

*“If the sauna, spirits and tar won’t help, then the patient must surely die.”*

„Jos ei sauna, terva ja viina auta, niin sitten perii hauta“  
(saying around Lahti)

*„Sauna is the medicine of Finland“*

„Saun Suame lääke o“  
(saying in Turku)

*“Sauna is a poor mans pharmacy”*

„Sauna on köyhän apteekki“  
(saying in the area of Teuva)

*“Then he tossed a scoop of water  
On the hot stones till they crackled,  
And the vapor was like honey  
Rising from the heated stones.”*  
(The Kalevala)

### **Social function in sauna**

Sauna promotes psycho-social health, as all bathers are naked and all divisions by status or rank disappear. This makes it an excellent place for social contacts and for conducting negotiations. This role is underlined by the relaxing effect, which smoothes over conflicts and differences in opinion. Joint bathing in sauna also encourages team spirit among athletes, soldiers, workers and other groups. The whole family going to sauna unites children and their parents.

### **Communication**

Sauna is a popular way of meeting people socially, it can be seen like a gathering around the campfire in the old days. Traditional silence and lack of chatter is not to be seen as unsocial.

### **„Saunas täytyy olla ku kirkos“ -**

#### **One has to behave in sauna like in a church**

Behaviour in Sauna is guided by strict rules Finns are taught already as a child: Shouting, cursing, quarrelling or telling stories are not appropriate in a sauna. Elderly people and young children talk the most in Sauna.

Sauna & God / Mythology

Sauna haltija - Sauna tonttu

The saunahaltija or saunatonnttu is a spirit, gnome or elf-like creature in Finnish mythology. It lives in the sauna and protects it, but also makes sure that nobody behaves improperly in it. Improperly meaning taking sauna too late or being disturbing or noisy in the sauna. The saunahaltija gets his own sauna whisk and water container and on Christmas it also gets some food. Upsetting the haltijas make the water drop from the rain gutter and the cold water boiling in the bucket. According the Finnish mythology Fennica (1789), Auteretar and her son Auterinen belong to the oldest löyly and sauna haltijas.



23. sauna haltija

Sauna in other countries

Foreign visitors to Finland are either repelled or fascinated by the thought of going naked to a hot, dark sauna room - but at least it is a very memorable experience. Worldwide interest in sauna was awaken again by the Finnish athletes of the Olympic games in 1924. Finnish sauna spread to the continent of Europe after the Second World War and is now widely spread expecially in Germany and Austria. The introduction of sauna culture in France has been not so successful, as saunas there are often of poor quality and heated in an insufficient way, or their purpose is completely different: they offer sensual services under the sauna name. These “saunas” have nothing to do with the real saunas, except maybe a heated room.

Sauna weirdness



24. wonder sauna hot pants, GHP



25. portable Finnish Sauna, 1962



26. thermometer - Saunia



27. makkaraputki - Hukka



## Mobile sauna festival in Teuva 2011

Due to my interest in compact saunas I have visited the mobile sauna festival in Teuva. The headline would be: „Anything goes“ - as there were various colourful saunas in style and function. Most of them were fired with wood, some with natural gas.

The main categories were:

saunas on trailers,

saunas in vehicles,

saunas on cars,

saunas and motorbikes and tent saunas.





The difference between German and Finnish sauna culture

The sauna became known in Germany through the Olympic Games which were held in Paris in 1924, where the press praised sauna as the secret for Paavo Nurmi to gain the bodily strength to win four gold medals. The Finnish athletes also had a sauna built for them in the Olympic village. When they were building their Sauna in the Olympic village of Döperitz in Berlin in 1936, it was used by the NS-regime as a part of their strengthening and invigoration programme. Through the founding of the “Deutsche Sauna Bund” in 1949 the sauna culture was promoted also after the NS-time. Within the growing wealth in the 60’s, mostly public-commercial mixed saunas for both men and women were slowly increasing. In Hamburg for example, all companies - even the public ones - were switching to mixed sauna operation. The biggest motives for having a sauna were right in the beginning invigoration, promoting health, illness prophylactics and conservation of vitality. Later on the aspect of conviviality and relaxation were following. Here is the biggest gap between sauna culture in the German speaking area and Finland, where sauna is seen foremost as purification. During the 70’s and beginning of the 80’s many private saunas were built in Germany and Austria. They were ordered by wealthy single-family-home owners of the upper and middle-class and installed most of the times in the basement. Standardized with sweating and resting room, hourglass, “The 10 commandments of sauna” branded on a wooden board, foot-bath, dip pool and sauna bar it became a symbol of wealth, luxury and modern life - it became a status symbol.

The empirical research of Gilbert Norden about saunas in Austria (1986) was showing that the demographic traits of sauna-visitors of age, education, financial capacity and working



44. sauna timer basic, Abatec AG

situation had significant similarities. Where the Finns enjoying the sauna bath for their own bodily well-being, the Austrian sauna-enthusiast has to obey - after Norden - strict rules in public-commercial saunas, after which showering, sweating, cooling down, a master throwing water on the stones and ventilating the air afterwards with a towel to distribute the heat, foot-bath and relaxation follow a strict pattern. In between one is eating and drinking in the bar in convivial company. The emphasis is on the recreational activities, what the name of “sauna and bath paradise” underlines. These elements have more in common with the medieval sauna culture in middle Europe than the sauna in Finland. Germans like to go to sauna on cold autumn and winter days in opposition to the Finns, who prefer to go in the hot summertime, to sweat the skin pore-deep and to clean the body thoroughly.



45. bathing rules for sauna and vital bath

Sauna terminology

Here is a small glossary of common Finnish words related to sauna:

- aineenvaihdunta** - metabolism
- alaston, alasti** - nude, naked, unclothed
- arina** - hearth, grate
- avanto** - hole in the ice
- avokiuas** - open stove
- eteishuone** - vestibule
- haalea** - lukewarm
- haihtua** - evaporate
- haju** - smell, odour,
- tuoksu** – scent, perfume
- heittää (lyödä) löylyä** - throw water on the heated stones
- hieroa** - massage
- hiipua** - die down
- hiki** - sweat
- hirsi** - log
- hormi** - flue
- hormikiuas** - sauna stove with flue
- häkä** - carbon monoxide
- häkälöyly** - steam raised to dispel carbon monoxide
- ilmanvaihto** - ventilation
- istuin** - seat, bench
- jakkara** - stool
- jano** - thirst
- jatkuvalämmitteinen kiuas** - continuously heated sauna stove
- joulukylpy / sauna** - Christmas auna
- juhannus** - midsummer
- jäähdytellä** - cool off
- karaistua** - become hardened
- kastepiste** - condensation point
- katku, kitku, tikku** - fumes, smell

- katos** - roof, shelter
- kipakka** - intense
- kipinä** - spark
- kippo, kauha** - scoop, ladle to throw water on the stove
- kiuas** - sauna stove
- kiuaskivi** - stone used in a sauna stove
- kiukaaneristys** - insulation for a sauna stove
- kiulu** - wooden pail, small pail or bucket to contain the löyly water.  
Usually made of wood: boards tied together with wooden hoops.
- koivu** - birch
- korsusauna** - sauna in a dugout
- kostea** - damp
- kosteuspitoisuus** - humidity
- kota** - hut
- kuiva** - dry
- kulmalaude** - corner bench
- kupata** - to cup
- kuuma** - hot
- kuumavesisäiliö** - hot water tank
- kuumentaa** - heat
- kylpeä** - bathe
- kylpyhuone** - bathroom
- laho** - rotten
- laihtua** - loose weight
- laipio** - ceiling
- lakeinen** - opening in the ceiling of a smoke sauna where the smoke escapes during heating
- laude, lauteet** - sauna bench
- lautalattia** - board floor
- leppä** - alder
- loikoa** - recline
- lämmittää, panna lämpiämään** - warm up, light the sauna
- lämmityspuu** - firewood
- lämpöarvo** - heat generation capacity
- löyly** - 1) Steam or vapour created by throwing water on the stones of the stove,  
2) The heat, humidity and temperature in the sauna in general

**noeta** - create, leave soot  
**pata** - pot  
**pesin, pesusieni** - face-cloth, sponge  
**peseytyä** - wash oneself  
**pesuhuone** - washing room  
**puhdistusmenetelmä** - cleaning method  
**pukuhuone** - he dressing room  
**pyyhe** - bath towel  
**räppänä** - air vent, Duct or vent on the sauna wall close to the ceiling.  
The size of the opening is usually adjusted with a simple slideboard.  
**saippua** - soap  
**sanko** - bucket  
**sauna** - Finnish style sweat bath  
**saunahaltia, -tonttu** - sauna gnome  
**saunoa** - have a sauna, go to sauna  
**savu** - smoke  
**savusauna** - smoke sauna: the original form of sauna with no chimney. While being heated the smoke from the burning wood under the stove fills the sauna and escapes through a hole in the ceiling (lakeinen) and through the door which is usually kept slightly open during heating.  
**terveydenhoito** - health care  
**tiku, kisu, kitku** - Unpleasant fumes in a smoke sauna right after heating, disappear in an hour or two after which time the sauna is ready  
**uida** - swim  
**vihta, vasta** - whisk, made of birch (or similar) twigs.  
Used for beating the body in the hot room to stimulate the feel of the löyly.  
**vesiamme** - tub  
**vihtominen** - hitting oneself with the sauna whisk  
**virkistyä** - become refreshed

**There is only one right way to do sauna: My way!**

Whenever I was asking Finnish people about their sauna habits, they were quite definite and answering with passion. It turned out that there is only one right way to have sauna - what it is did not get quite clear to me, as the suggested ways of having sauna and the preferences seemed to be personal, subjective and not having a common denominator, sometimes they were even contradictory. Some like the sauna as a quiet place, for others it is a place for family communication and sharing stories, some like the sauna to meditate, others to party, some like going to the sauna alone, others in groups. Coming from a country where official sauna rules can be found on the outside of every (even private) sauna, it seems to me that the right way to have Finnish sauna is according the maxim: do as you feel best.



**Own sauna / material**

Starting points

The starting points for my sauna development were:

tool for togetherness

It should be nice, comfortable place, where people have fun and enjoy the company around.

4-5 persons

The size of the sauna should be that 4-5 people can have a sauna bath at the same time.

communication

It should increase communication - through the circular shape of the seating people can see into each other's eyes while enjoying a sauna bath.

wellbeing

Sauna and well-being are self evident. This should be supported also by the interior.

atmospheric inside & outside in night time / play of light

In the Sauna there should be indirect, dimmed lighting. It should not be too dark and not too bright. There could be a connection between inside lighting and outside light during night time, for example the sauna acting like a lampshade.

easy to transport and to set up,

It should be a module, which can be taken and set up without a lot of assembling.

both sculpture and sauna

The sauna should be an experience and pleasing to the eye both from inside and outside. It also should integrate in the surrounding area from the outside.

materiality

local wood (pine, Siberian larch)

artisanal

back to the roots

It should join cultures and establish a connection of Black Forest and Suomen metsä.

The infrastructure would be defined as following:

access to water

There should be either lake or sea in immediate surrounding or a water connection for washing and refilling the bucket for the sauna steam.

electrical power

solar panels  
artificial lighting inside



46. floating sauna, Hardangerfjord Norway, Casagrande & Rintala, 2002



48. bicycle sauna Kolonok, H3T, 2011



47. sauna box, Castor, 2011



49. Archstoyanie festival of landscape objects, Nikola-Lenivets, 2008



50. wood studio workshop: sauna - Timo Ripatti, Ville Kokkonen, Saara Renvall, Antti Ylitepsa, 2000



53. gondola sauna, Ylläs Sport Resort, 2008



51. Futuro, Matti Suuronen, 1968



52. Walden garden shed, Nils Holger Moormann, 2006



54. Solaris sauna, Mika Ihanus, 2011

## Sauna materials

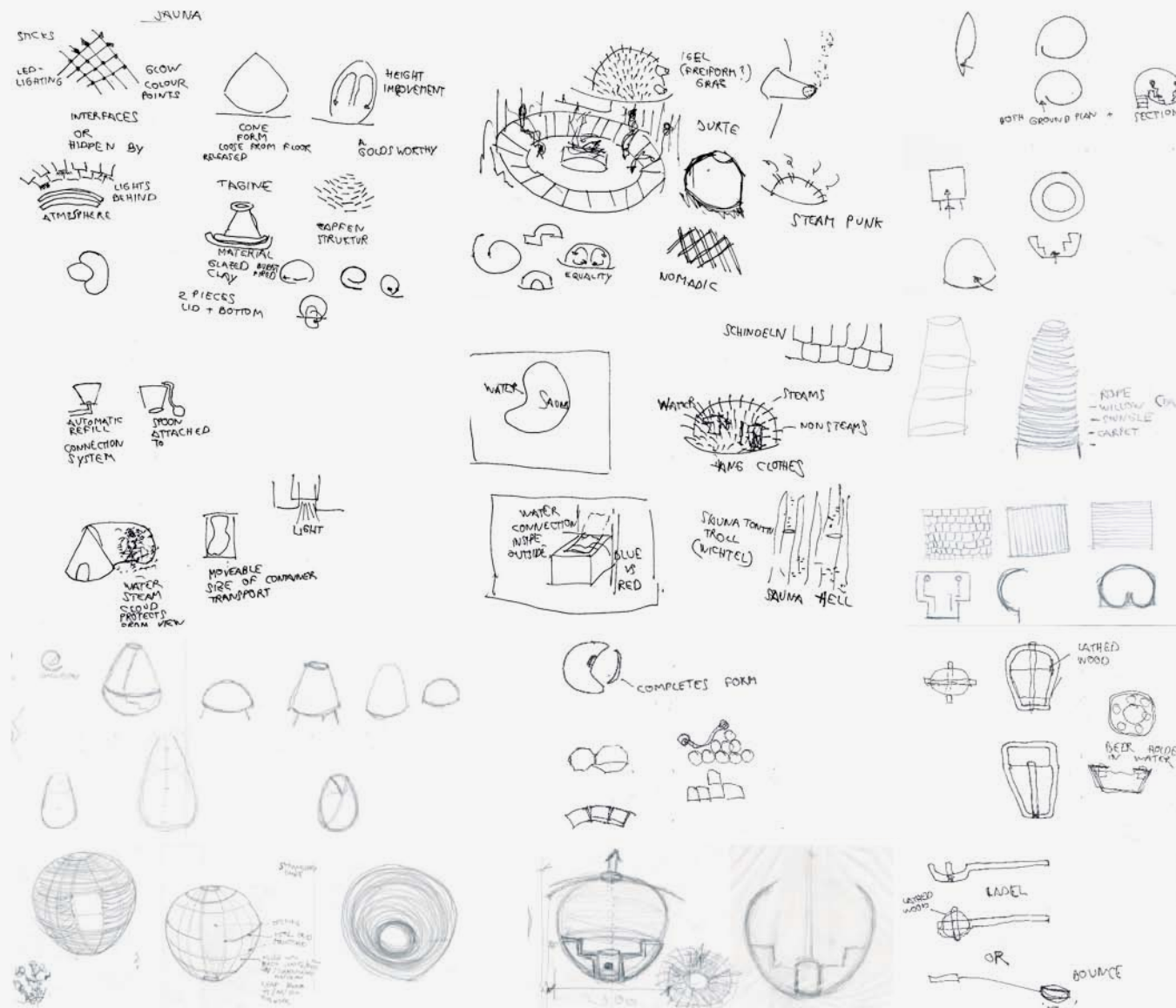
The materials used in the Sauna project are local Finnish and durable materials. In Finnish forests there grows spruces, pines and larches. So I decided to use Kerto plywood for the structural parts and seating, Siberian larch for the inside and outside panelling.

### Siberian larch

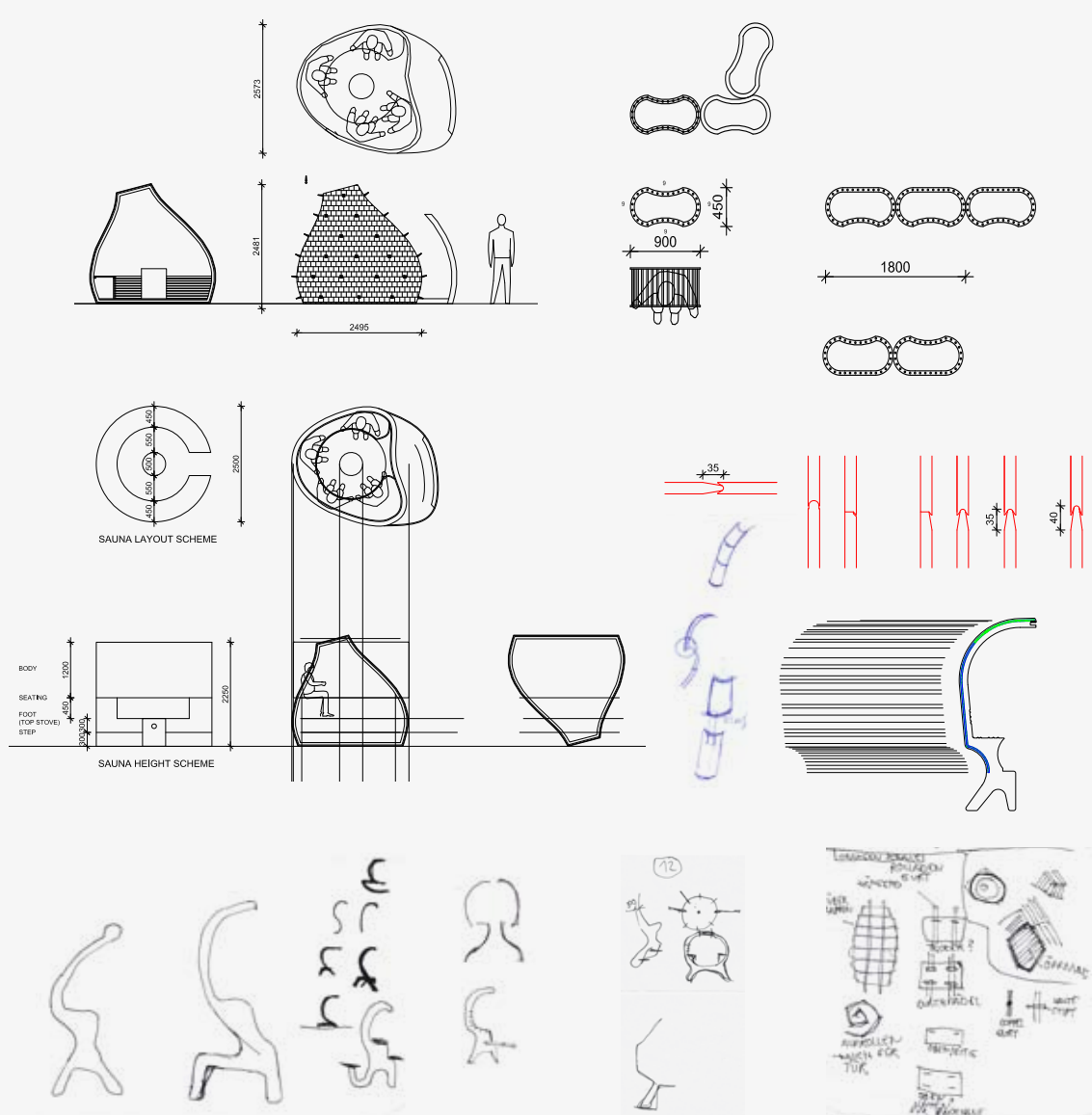
Larch is quite durable, due to their amount of resin and good resistance to moisture. It is commonly used in wall panelling in building facades. In sauna application also in interior lining walls and ceiling and floors both in the stove room and the washing room. Larch timber also has a pleasant scent when wet. Larch has a light brown surface and a greenish brown heartwood.

### Kerto plywood

The plywood is made of spruce. It has a faint resin scent and the colouring is light. And as it is plywood, it has a good deformation stability compared to timber, which provides a good and stiff structure. The use of timber boards i saves both resources and it is economic. It provides the possibility to use industrial processing of standardised products with predictable mechanical characteristics.

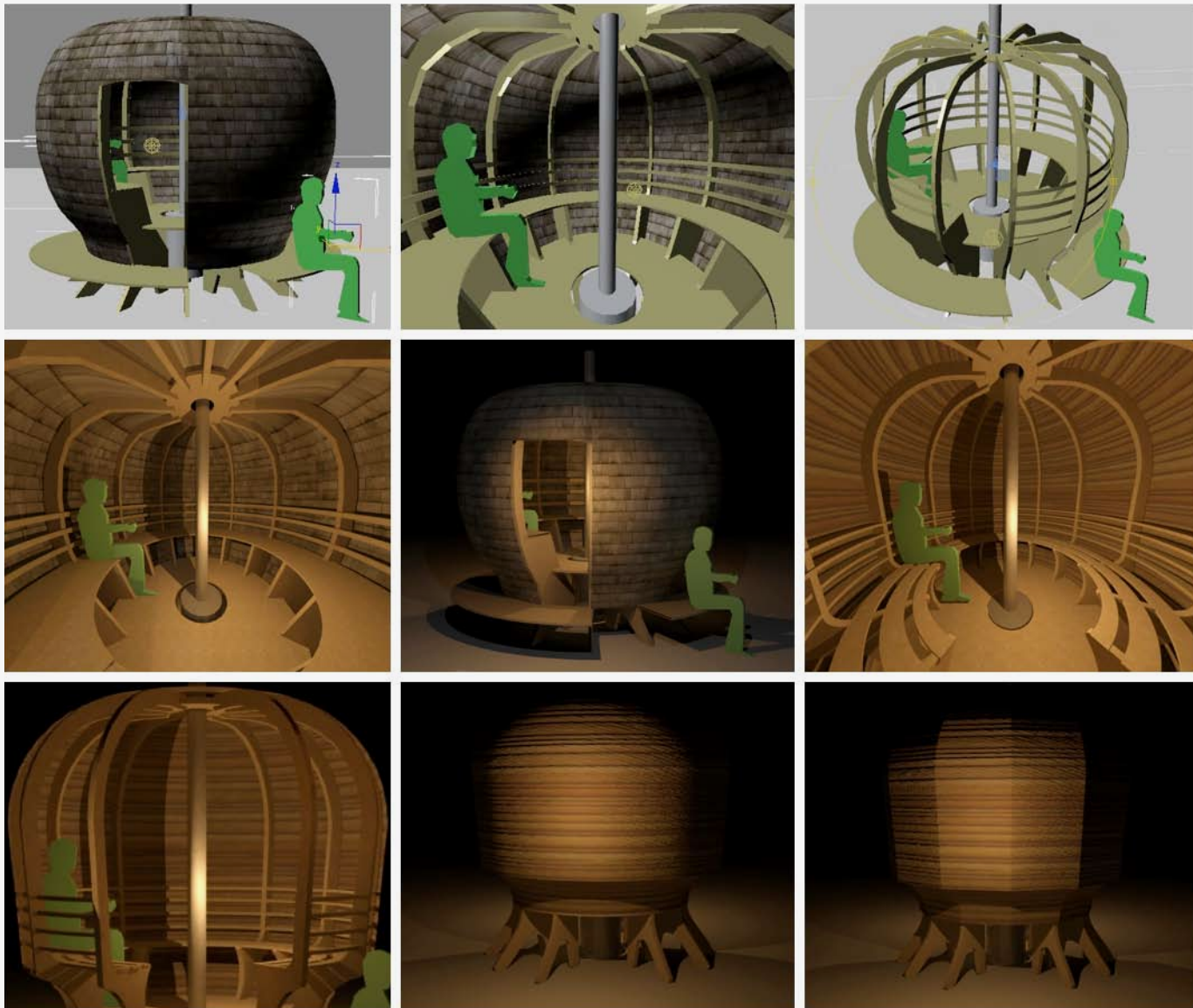


55. initial sketches

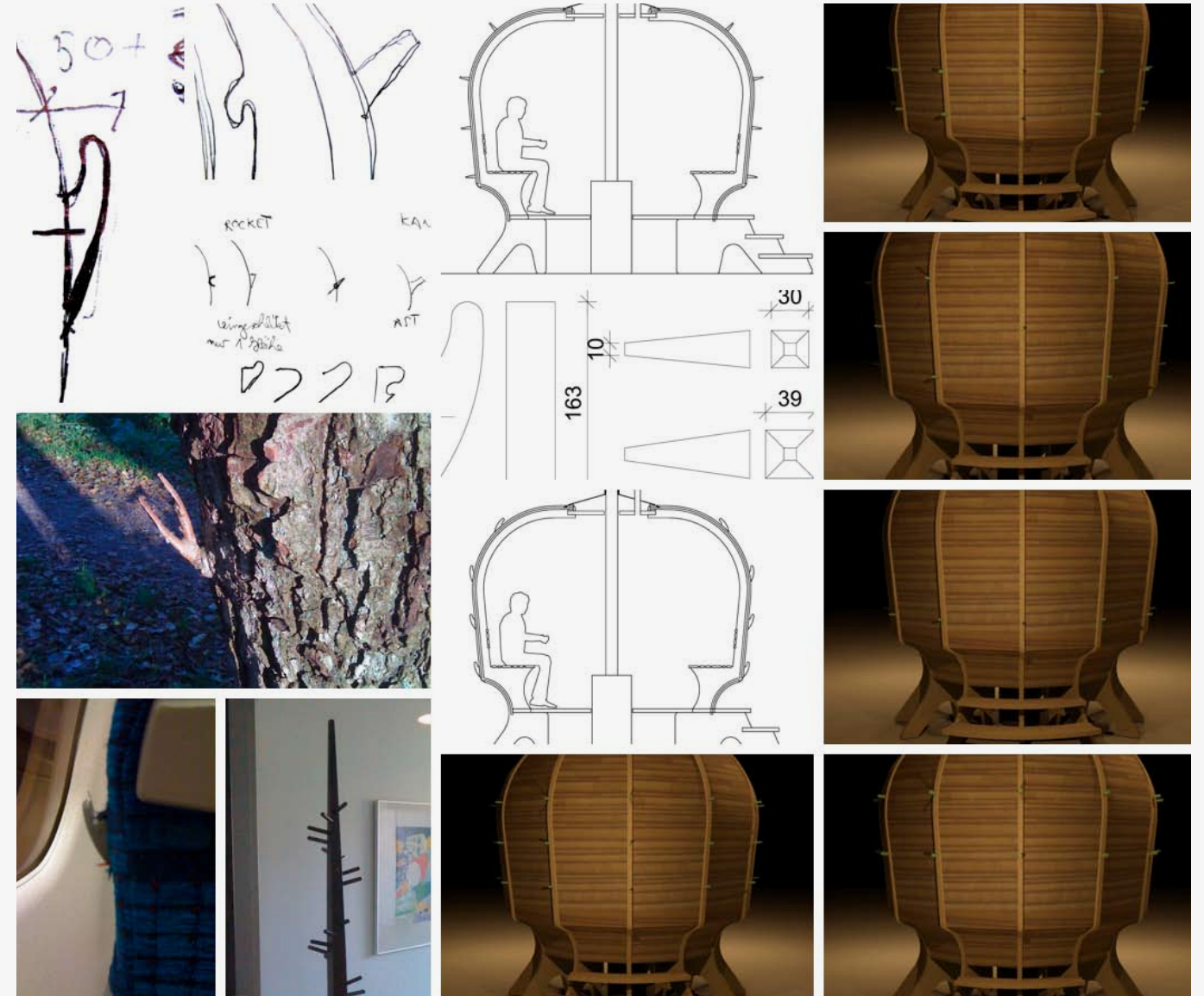


56. initial sketches





57. 3d model studies

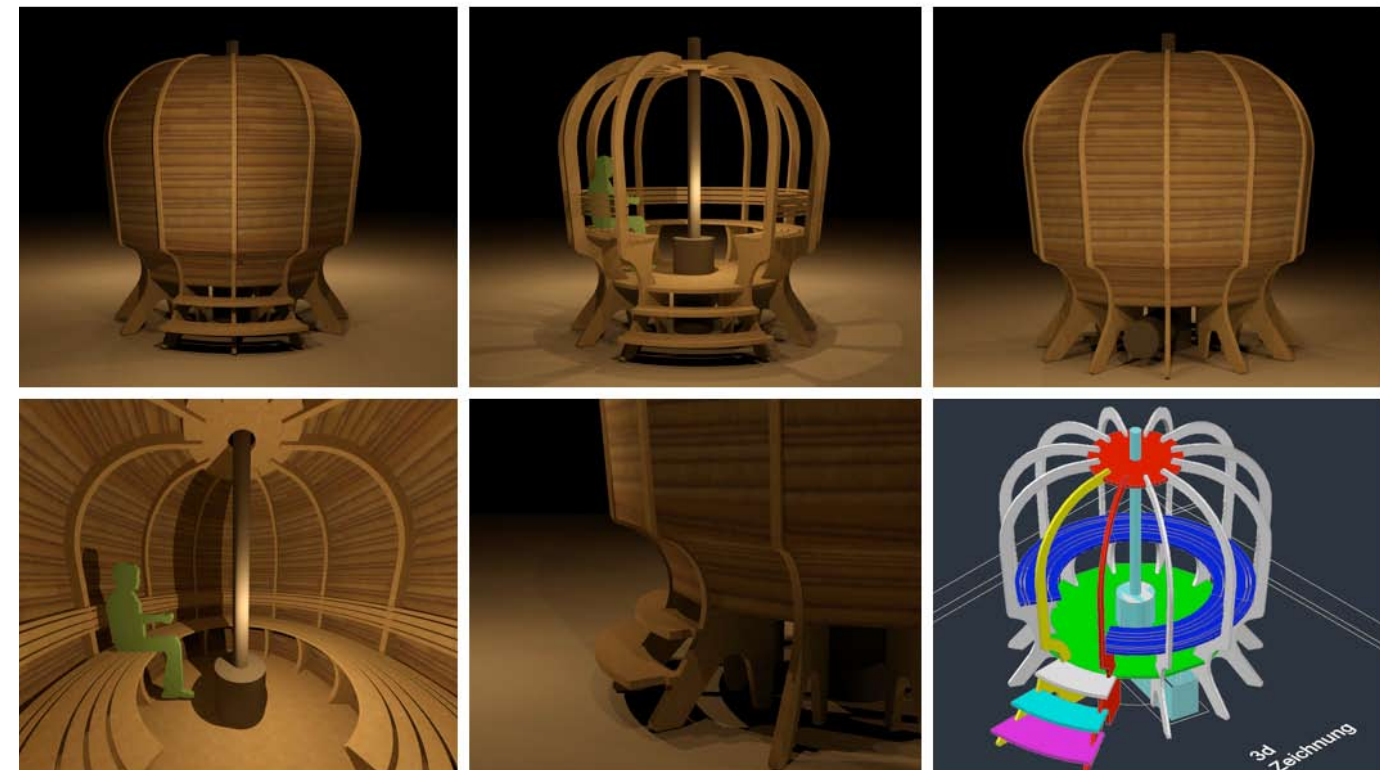


58. studies - outdoor pins





59. wooden scale model 1:10



60. 3d model studies





61. mock-up, scale 1:1





62. production of final pieces



63. production of final pieces



Finding the right stove

My goal was to design an outdoor sauna which is independent from power and water connections. It should also provide the best possible sauna experience both physically and atmospherically. This is why I chose a wood-fired stove. Sauna experts claim that the one-time heated smoke stove produces the best sauna steam. But it takes at least 5 hours to heat up the sauna, and there is a lot of work on maintaining the sauna, as one has to clean the sauna from soot before use - not to mention the higher risk of setting the whole sauna in fire. That is why I decided to use a continuous heating wood stove, which is ready to use after 1-2 hours of heating. The stove is fed from outside the sauna and the temperature can be adjusted by the amount of wood which is put inside. And after enjoying sauna, people can gather around the notch and enjoy kiuas-makkara, a sausage prepared in the stove.

Security

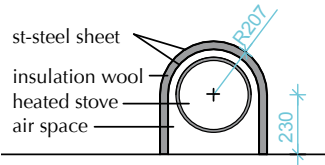
As the stove is in the centre of the sauna and in immediate reach of people having sauna, the question of security was raised. The special construction of the IKI-Stove, which transports the hot fumes in a spiralled flue through a cage filled with stones, ensures that the highest temperatures stay in the core of the stove and accidentally touching the stove would not cause any harm. The straight flue, which transports the smoke through the ceiling to the outside is also double-walled and insulated, so that the bathing people accidentally touching the stove would not get injured. As the stove is situated underneath the wooden flooring and is being fed from outside, the structure of heating chamber had to prevent the structure and the floor from catching fire. The building structure in the vicinity of the oven is therefore insulated by a high-performance biodegradable, mineral and ceramic fibre board, namely Isoplan 1100, which has a very high application temperature limit up to 1100° and low heat conductivity. The oven itself is insulated with a 3-layered tunnel structure made of bent stainless-steel sheets and filled with heat insulation wool in between.



64. insulated flue



65. ceramic fibre boards



66. section of the stove heat insulation

### Size of the sauna

The initial measurements of the sauna drafts were geared towards easy transportation in one piece, meaning that the sauna would be not wider than 2,55m - which is the maximum size for transporting goods without special permission on the streets and highways in Finland. Later on in the designing process the sizes of the sauna grew bigger to ensure comfort inside the sauna - as too tight sitting would impair the overall sauna experience. It has now a total width of 2,95m and the height of the sauna is 2,85m. The issue of transportation without special permission is solved by making the structure such that the sauna can be easily dismantled and built anew. As it provides the best sauna steam when the top of the stove is on the level of the feet of the sauna bathers, the floor of the sauna is raised to provide enough space for the stove underneath.

### Ventilation

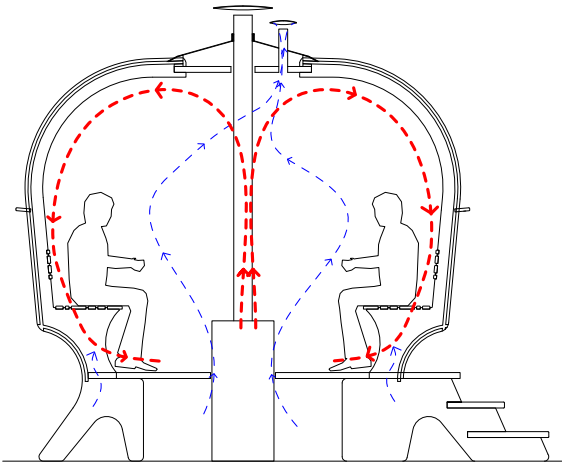
The sauna is using natural ventilation, where air is drawn inside from the bottom part of the sauna and let out in the top part. There are two main areas of air inlets for the fresh air in the bottom part, one is the gap in the centre around the stove and the other ones are eleven slits in the flooring near the outer skin under the seats. The air outlet in the ceiling part can be adjusted freely according to the needs, thus providing a slight air exchange during the sauna session or a bigger current when the sauna is not in use and needs increased airflow to dry the interior.

### Water drains

The air inlets in the flooring in the centre around the stove and the slits in the flooring near the outer skin have a second function as water drains for the waste water spilled in the interior during bathing. These lead the water outside the sauna and into the ground.



67. adjustable air vent inside the sauna

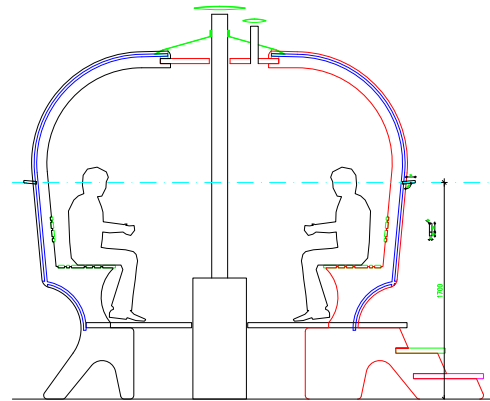


68. air ventilation inside the sauna  
red - hot air circulation / löyly, blue - fresh colder air

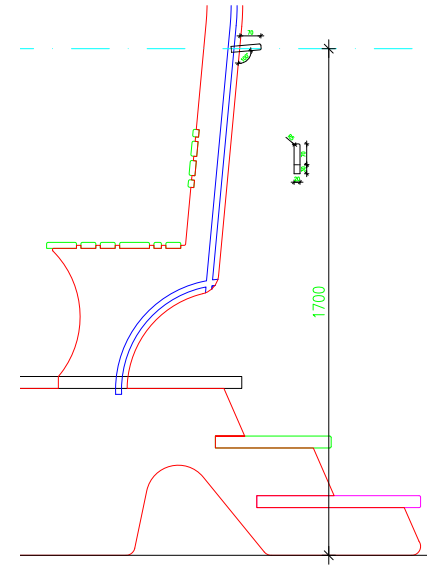
## Accessories

### Outdoor pins

Initial sketches of the sauna were based on the hedgehog principle: there would be many quills on the outside and the sauna bathers would throw their clothes on them and jump to the sauna. After creating the final appearance of the sauna this idea still remains active, a more humble round of pins were added around the sauna to provide this function without giving a too ornamental or aggressive feel to the outside.



69. detail outdoor pin



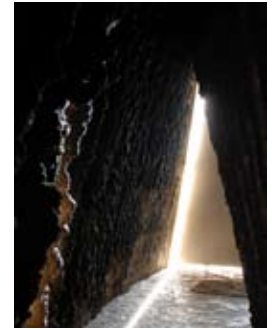
70. detail outdoor pin

## Spatial atmosphere

As I learned, I am dealing with the most sacred space of the sauna - the steam room - löylyhuone. So I intended to keep the interior calm and sacral.

The spatial arrangement would carry a symbolic connection back to the roots of mankind by placing the stove in the centre of the room. People would sit around the fire and enjoy the heat in a very archaic way. In that way they would connect with both the fire and the people around, creating an intimate atmosphere, which might lead to sharing stories and increased communication.

There is very restrained indirect lighting inside, which is reflecting the colour of the wood and contributing to the atmosphere in an unobtrusive way.



71. Bruder Klaus chapel Wachendorf,  
Peter Zumthor

## Inside vs. outside

The interior of the sauna is introverted: it is collecting the senses, giving focus and fading out the outside and providing a warm and calm interior. The outside of the sauna is the opposite: open and accessible, not providing any shelter except the sauna itself. It lets experience the surroundings of the sauna and confronts the user with nature: sunshine, rain, snow, darkness and temperature. So even though the sauna is not very much depending on the surrounding context, it still is an important factor in its use.

The shape

The shape is defined by the centralised seating around the sauna stove, by the number of people using it and by human ergonomics. The inside height is 2 metres. The seating height a standard 450 millimetres, the depth 550 millimetres. The ceiling shape is created in that way to distribute the löyly equally in the sauna space, so that there are no too hot and no very cool places in the sauna.

The sauna is elevated to fit the stove underneath and it is standing on feet, which lift the löylyhuone visibly from the ground thus giving the building a light appearance. The stairs in front of the building create a threshold between outside and inside. Originally my aim was to create something in the size between an outdoor furniture and a building. As it turned out to be a sauna, and nobody is talking about sauna furniture in that sense, the project needed a building permit to be erected. However, the aim of the project was still to create a temporary character that the building is temporary in that place, thus touching the ground in a sensitive way.

The structure is planned in the way, that the building can be lifted up from the top with a crane and so being able to be moved around in one piece.

Kanto - the name

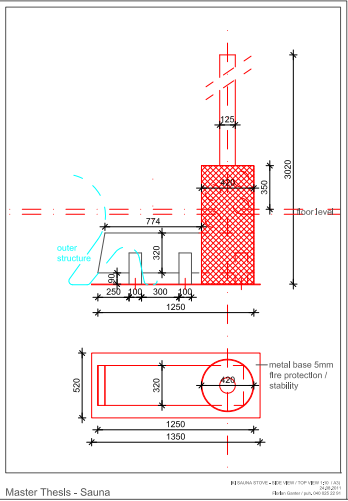
The name of the sauna is “Kanto”, which could be translated as “stump” in English. The reason I chose this name is for one the overall appearance of the final product. A stump is also a stable foundation and it has far reaching roots - just like sauna is a base, which is deeply rooted in Finnish culture and society.

Working with IKI-Kiuas

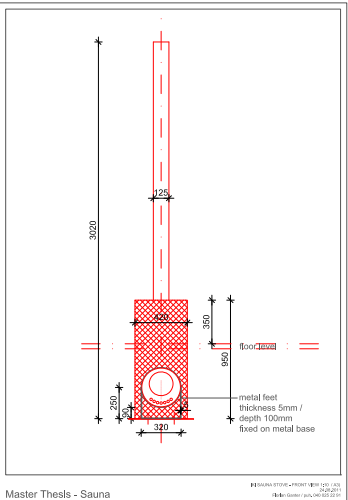
I had my first contact with IKI-Kiuas in the end of November 2010, when I met Harri Kuusjärvi and Jouni Kerrman to learn about sauna stoves: the difference between smoke stoves, stoves with flues and electrical stoves. I was especially interested in the distance the sauna bather has to keep to the stove as it is crucial for the arrangement in the sauna I was planning to have. It turned out that the distance a sauna bather has to the IKI-stove can be quite short, as there is an air circulation in front of the oven. Further on the mesh cools the stones down and one is even able to touch them from the outside of the oven. The temperature of the stove is not so high, the room is heated up to ca. 50 degrees Celsius, which leads to a high air humidity and a comfortable löyly. The sauna effect is created through the löyly, which creates the feeling of heat, in the meanwhile the temperature of the oven sinks. The walls of the sauna are getting warm after a while, which also leads to a comfortable feeling. In this meeting I was able to visit the manufacture of IKI-Kiuas and could get a close look in the production process.

My second approach to IKI was in June 2012, after I had the initial sketches done. I introduced my project and Jouni Kerrman and I were discussing about the possibilities to build the stove.

Then the needed measurements were defined, the proper function was confirmed and the stove went into production at the manufacture for bespoke stoves in Tampere, there it also got painted and finally the mesh was produced in Helsinki.



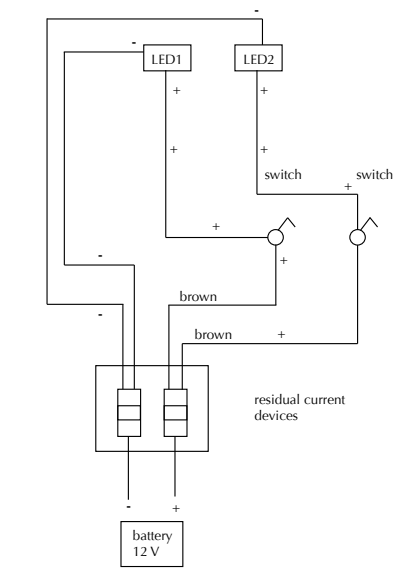
72. drawing of the stove, side and top view



73. drawing of the stove, front view

Lighting inside the sauna

As the sauna interior is a sacral and calm space, no windows are integrated to avoid disruption of the interior. As the sauna does not have any windows or light slits and the sauna is used in darkness, artificial lighting is introduced in the interior. There is reduced direct LED lighting in the ceiling above the stove and a indirect SMD lighting strip under the seat. The lighting is powered by a 12V battery placed outside the sauna which can be recharged with solar panels. Each circuit is turned off separately with light switches. Safety of the power circuit is ensured with the use of a residual current device.



76. diagram of the electric wiring



74. waterproof SMD light strip



75. LED spots



77. connectors and power adaptors for LED spots

The location of the full-scale prototype and the sauna in space

The original vision when I created the sauna was to put it in vicinity to a lake or seashore where one can take a dip after the sauna bath and clean oneself. As it is an independent sauna module, it can be used also in an urban environment. The area of Arabianranta is known as a living area enriched with art pieces so I contacted Tuula Isohanni, the art curator of Arabianranta to see if there would be any space for my sauna project. Tuula was a big help and a great support for my project. I had three choices of locations for the sauna: one on the seashore, one in Kaj Franckin katu between two building blocks and one fallow land in the corner of Arabianranta / Muotoilijankatu, which is currently used by residents as garden area. I opted for the last one, as it can be very windy and uncomfortable on the seashore especially in wintertime and there would not have been any social control over vandalism. The location between the two building blocks in Kaj Franckin katu on the other hand is too close to the surrounding buildings. So I decided to build up the prototype of the sauna in a space in the corner of Arabianranta / Muotoilijankatu, where it also has the advantage of being able to use the infrastructure of TaiK and the Heltech College of Technology. It is a very visible corner place in the urban structure, but not disturbing the inhabitants of the area with noise and smoke, as two of the direct neighbouring buildings are a school and an office building and there is a more generous distance to the neighbouring flats. I had to get the permission from the land owners and the permission of the renters of the land to put the sauna there. Then I had to hand in an official application with site drawings and elevations for the building permission at the City of Helsinki.



For my proposed concept of use, I had to explain the interested public what would be happening on the site. The sauna concept for this location is that the inhabitants and students can use the sauna. There will be a bigger bucket filled with water for basic washing and to create the steam. The waste water, which is not a big amount, flows to the ground. Basic washing and changing the clothes takes place inside the sauna or externally for example in the premises of TaiK. The lighting inside the sauna is battery-powered, which means there is no direct connection to electricity needed.

As the ground of the location is plain soil with sand and the sauna will be at this place for seven months and during winter-time, a proper plinth consisting of gravel, sand and concrete tiles had to be built, to prevent the sauna from sinking into the ground.



78. location in the corner of Arabiankatu / Muotoilijankatu

## Finnish sauna made in Schwarzwald

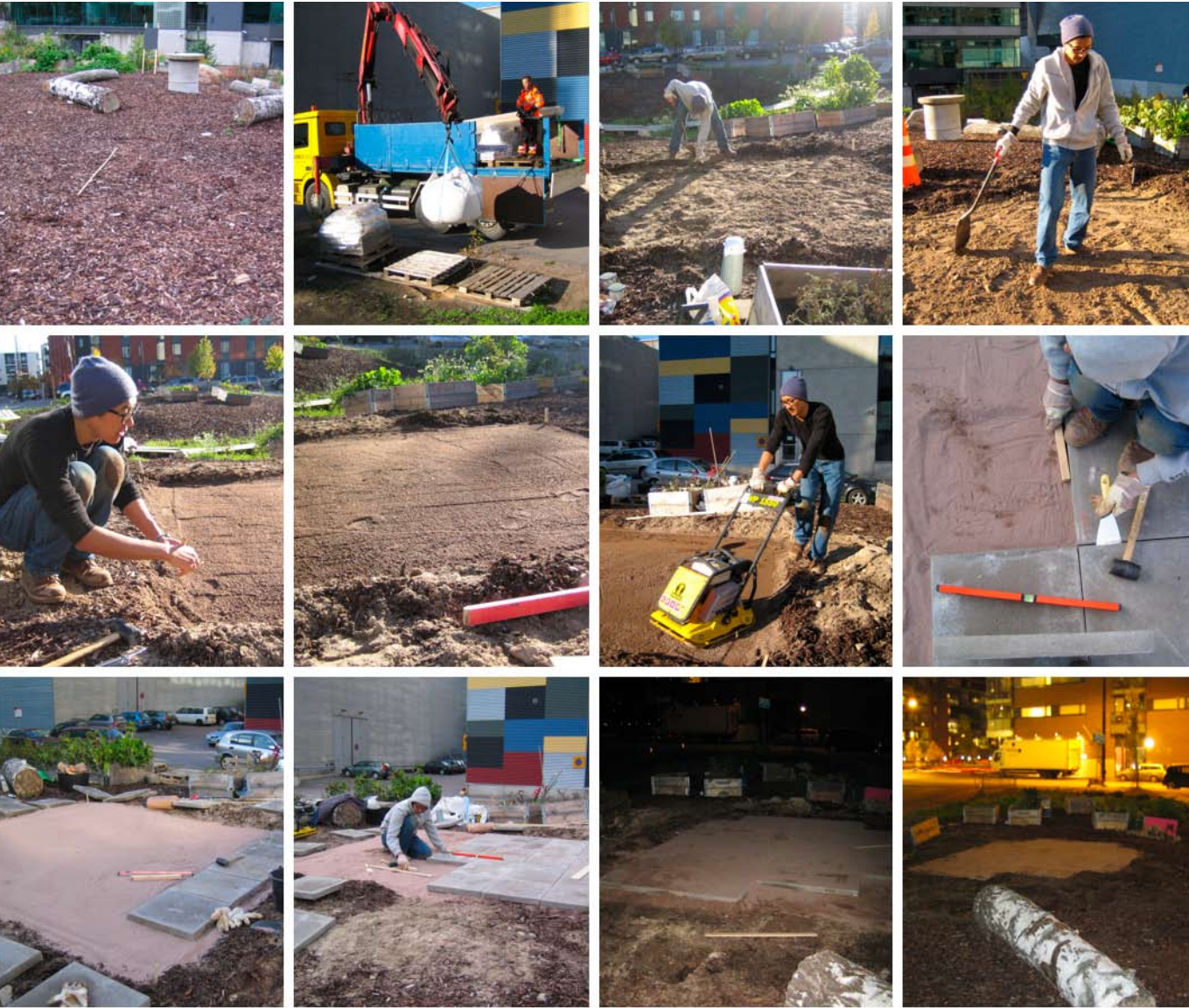
The Kanto-sauna project is a Finnish sauna, which is produced at Ladenbau Ganter GmbH in the Schwarzwald, Germany with Finnish materials. This is firstly due to my roots and my network of production being in Germany and secondly because I wanted to bring together Finnish and German artisan cultures, as they both are close to my heart.

## Sauna furniture

One of the first drafts for the sauna contained a set of furniture one could use during the sauna bath. It would have been loose, freely adjustable for comfort during bathing and one could have been used it outside the sauna as well. I abandoned the idea, though, because I was not comfortable with the thought of furniture wandering around and for example finally ending up all outside whereas there would be need for it inside. Another issue was that in terms of transportation, one would have to take care of yet another set of items to be packed, not to mention the question of securing the items during transportation. That is why I opted for an integrated sauna bench as an easy and safe spatial arrangement. The only loose items are the sauna bucket and the sauna ladle.

### Getting real - creating the foundation

For the location of the sauna in Muotoilijankatu / Arabiankatu a proper foundation was needed. The sauna will be in this location for seven months and during wintertime and the garden area is built on soft ground consisting of stones with sand and covered with mulch. So the mulch was removed and a 6 cm layer of gravel was laid upon the compacted ground. This was compacted again with a vibrating unit and finally the concrete tiles were laid upon another 3 cm layer of sand. 1 ton of gravel, 400 kg of sand, and 36 concrete tiles were used in the process.



79. building the foundation





80. assembling and painting the sauna



81. moving the sauna





82./83. moving the sauna





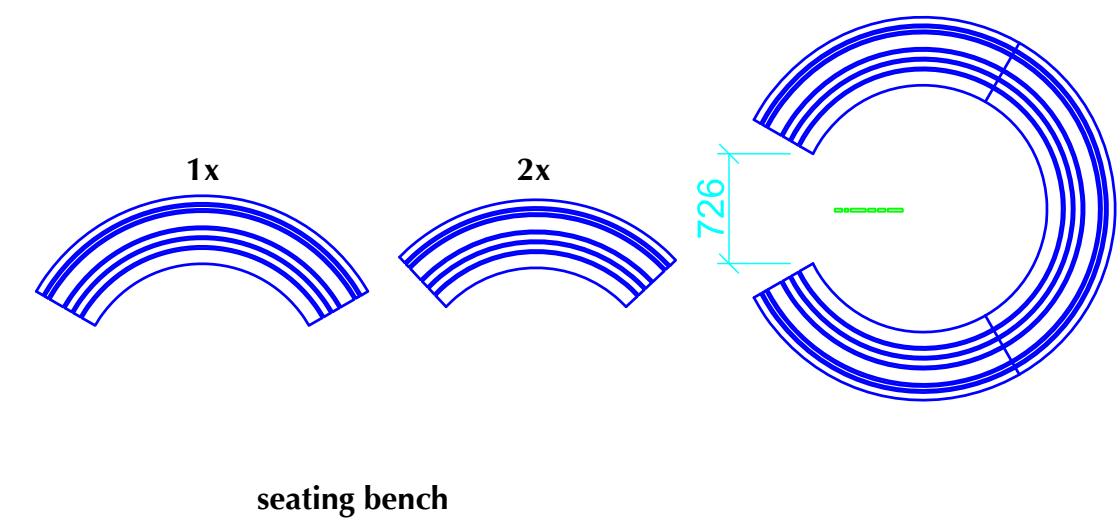
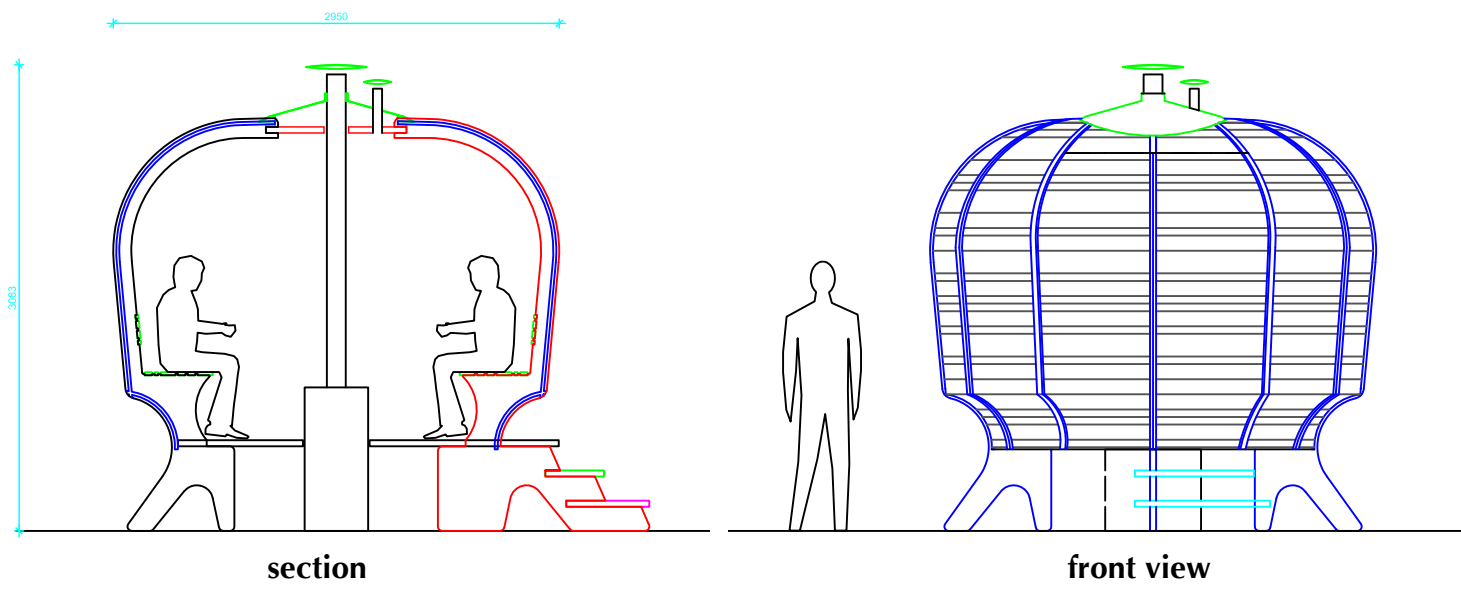


84. moving the sauna, the finishing touches / 85. stove detail



**Technical drawings**





step 1  
1x



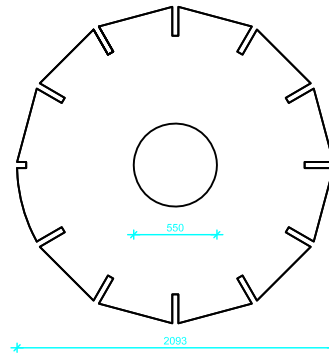
step 2  
1x



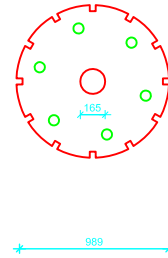
pedestal  
extension  
1x



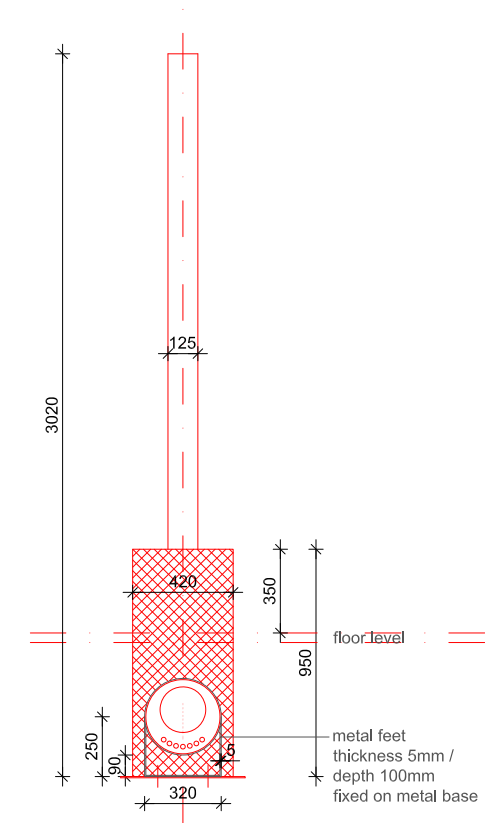
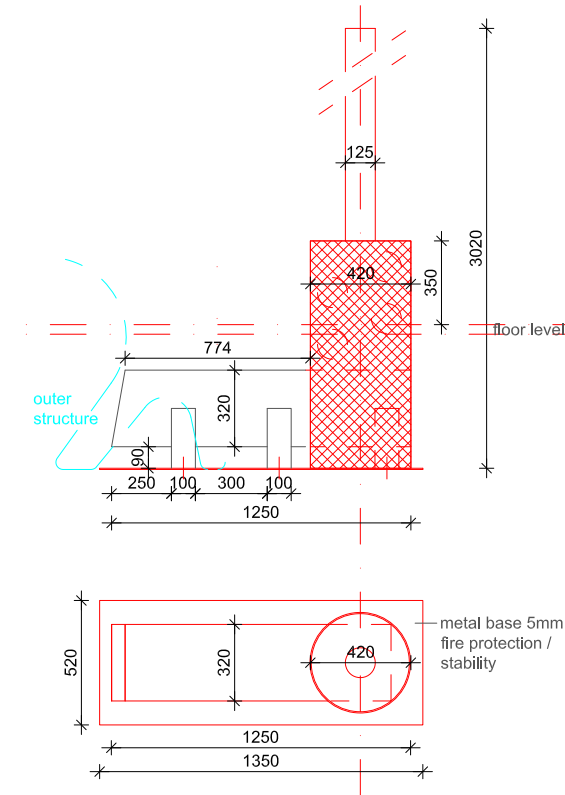
pedestal  
1x



ceiling  
1x



## stove drawings





**Kanto - Instant Outdoor Sauna**























## Conclusion

Rather than a finished project, the outcome of the thesis is to be seen as a intermediate milestone - a first working prototype to test, develop and improve.

During the process I learned amongst other things a great deal about sauna culture, technical detailing, cooperation and technical problem-solving together with craftsmen, the complex processes of setting up a building in cityscape. The thermal insulation of the stove is an issue that could be still visually improved and also in terms of heat-loss efficiency. Even though I was taking it into account in the planning process, only time will show the real behaviour of the materials towards weathering and wearing.

In my work I was concentrating on the different way of heating the sauna, which works very well and the löyly really wraps itself around ones body while using the sauna.

A comfortable social experience has emerged during the test baths. This still has to be tested further, as my focus has been still on professional matters and less on relaxation in the sauna. I am happy to notice that the overall acceptance of the surrounding residents is positive and that people are eager to have a sauna bath in Kanto. I hope this is the first of many saunas I will be building in future.

**Thank you.**

I would like to thank my entire family, especially my father, for their support, their patience and kindness.

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Johanna Hytönen, Helsingin kaupungin kiinteistövirasto, tonttiosasto  
Jouni Kerrman, IKI-Kiuas  
Riitta Eskelinen and Hanna Salonen, Tikkurila  
Kimmo Lattu, Keracomp

Supporting companies:  
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www.sauna.fi

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